

An airborne disease often called “consumption,” TB spreads principally through coughing and sneezing, damaging lungs.

TB was one of the principal causes of death among the urban poor in the nineteenth century during the Industrial Revolution. The death rate from TB declined in the United States from 200 per 100,000 in 1900 to 60 in 1940 and 0.5 today. However, in LDCs, the TB rate is more than ten times higher than in MDCs, and nearly 2 million worldwide die from it annually. TB is more prevalent in poor areas because the long expensive treatment poses a significant economic burden. Patients stop taking the drugs before the treatment cycle is completed.

The third factor in the reemergence of epidemics is improved travel. Motor vehicles allow rural residents to easily reach urban areas and urban residents to reach rural areas. Airplanes allow residents of one country to easily reach another. As they travel, people carry diseases with them and are exposed to the diseases of others.

Several dozen “new” infectious diseases have emerged over the past three decades and have spread through travel. A(H5N1) is a virus that has affected billions of a particular species of traveler—birds. The virus, commonly known as avian or bird flu, has infected and killed a wide variety of both domestic and wild birds.

Avian flu had infected 258 people as of 2006, and 154 died. Epidemiologists have been able to follow the movement of cases westward from Southeast Asia toward Europe and Africa (Figure 2–25). One early victim was a Vietnamese man who lived in a hut on stilts in the Mekong River. When he fell ill, he took a boat to the local health station and was transferred first to a district hospital and then to the capital Ho Chi Minh City. If the flu had the ability at the time to spread easily among humans, just one Vietnamese man would have infected thousands.

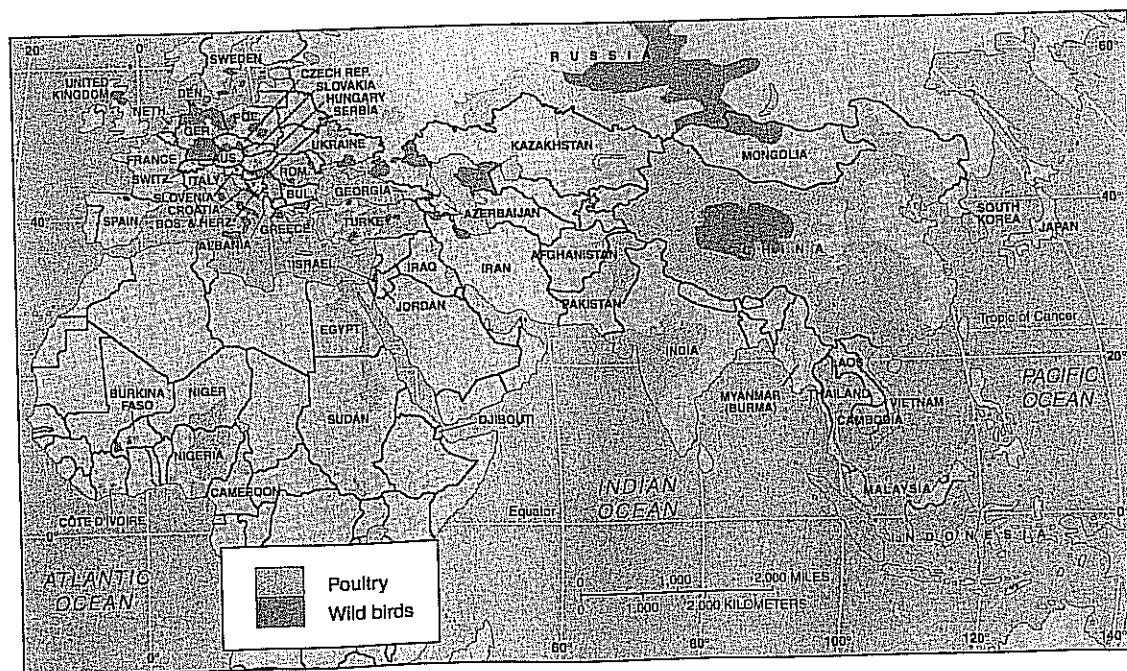
Avian flu was not believed to infect people easily, nor was it believed to be contagious. But epidemiologists warned that it would take only a modest change in the genetic composition of the virus to turn avian flu into a **pandemic**, which is a disease that occurs over a wide geographic area and affects an exceptionally high proportion of the population. When an earlier form of avian flu mutated in 1918, 50 million died worldwide, including 675,000 in the United States. The 1918 pandemic affected primarily people between the ages of 20 and 40, including 43,000 U.S. soldiers fighting in World War I.

How do we know if avian flu is a pandemic? Geographically, outbreaks of the flu would erupt simultaneously in many locations, outside the usual winter flu season. The disease usually starts with fever, fatigue, headache, and pains. Within a few days it can turn into pneumonia, filling lungs with fluid.

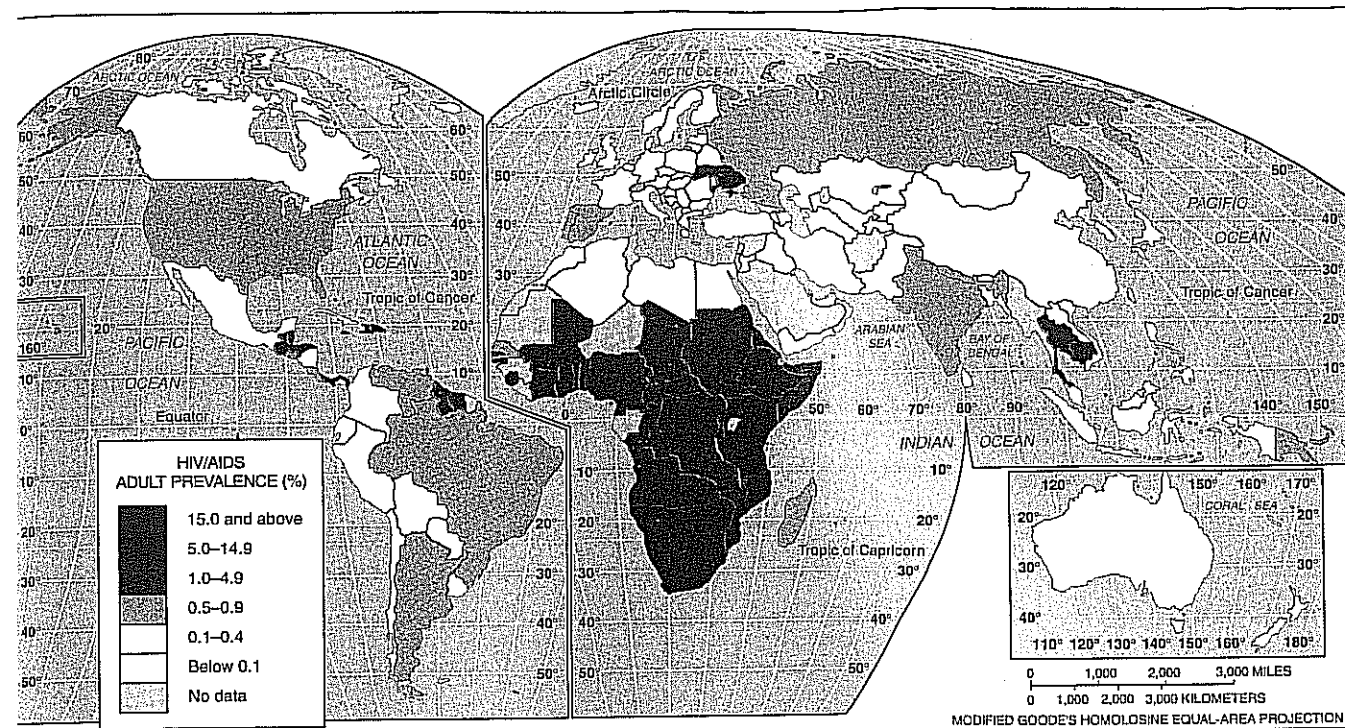
**AIDS.** The most lethal epidemic in recent years has been AIDS (acquired immunodeficiency syndrome). Worldwide, 20 million people had died of AIDS as of 2006; and 40 million were living with HIV (human immunodeficiency virus, the cause of AIDS).

The distribution of AIDS within the United States was discussed in Chapter 1 (see Figure 1–22), but 95 percent of people living with HIV and 99 percent of new cases during the past decade come from LDCs. There were 25 million people infected with HIV in sub-Saharan Africa in 2006, 8 million in Asia, 2 million each in Eastern Europe and Latin America, 1 million each in North America and Western Europe, and 1 million elsewhere in the world (Figure 2–26).

The impact of AIDS has been felt most strongly in sub-Saharan Africa. With one-tenth of the world’s population,



**FIGURE 2–25** Avian flu 2003–2006. The first cases of avian flu were recorded in Southeast Asia.



**FIGURE 2-26 HIV/AIDS, 2005.** The highest rates of HIV infection are in sub-Saharan Africa. India and China have relatively high numbers of HIV-positive adults, but they constitute a lower percentage of the total population.

sub-Saharan Africa had two-thirds of the world's total HIV-positive population and nine-tenths of the world's infected children. South Africa had the most cases, 6 million, whereas Botswana and Zimbabwe had the highest rates of infection—one-third of the two countries' adults were HIV-positive. Other than South Africa, the country with the highest number of HIV-positive people in 2005 was India, with 5 million. The second highest rate of infection was in Caribbean countries

such as Haiti, where 4 percent of adults were carrying the virus in 2005.

CDRs in many sub-Saharan Africa countries rose sharply during the 1990s as a result of AIDS, from the mid-teens to the low twenties. The populations of Botswana, Lesotho, and Swaziland are forecast to decline between now and 2050 as a result of AIDS. Life expectancy has declined in these three countries from the mid-50s during the 1980s to the mid-30s now.

## SUMMARY

Overpopulation—too many people for the available resources—has already hit regions of Africa and threatens other countries in Asia and Latin America. The world as a whole does not face overpopulation immediately, but current trends must be reversed to prevent a future crisis.

Geographers caution that the number of people living in a region is not by itself an indication of overpopulation. Some densely populated regions are not overpopulated, whereas some sparsely inhabited areas are. Instead, overpopulation is a relationship between the size of the population and a region's level of resources. The capacity of the land to support life derives partly from characteristics of the natural environment and partly from human actions to modify the environment through agriculture, industry, and exploitation of raw materials.

The track toward overpopulation already may be irreversible in Africa. Rapid population growth has led to the overuse of land. As the land declines in quality, more effort is needed to yield the same amount of crops. This extends the working day of women, who have the primary responsibility for growing food for their families. Women then regard having another child as a means of securing additional help in growing food.

Should the current world rate of natural increase continue for several decades, global population would far exceed even the most optimistic estimates of world food and energy capacities. In another thousand years there would be less than 1 square foot of land per person in the world, including deserts, mountains, and ice caps.

These projections are not intended as *predictions*. They are offered to illustrate the significance of current growth rates and to demonstrate the need to modify current trends. The challenge is to lower the current rate of population growth before the negative consequences of a large population pose insoluble social and economic problems.

We cannot completely explain the overpopulation problem until we see how people in different regions earn a living and modify the environment. However, we can reach some conclusions by briefly reviewing the key issues raised at the beginning of this chapter.

1. **Where is the world's population distributed?** Global population is concentrated in a few places. Human beings tend to avoid those parts of Earth's surface that they consider to be too wet, too dry, too cold, or too mountainous. The capacity of Earth to support a much larger population depends heavily on people's ability to use sparsely settled lands more effectively.

2. **Where has the world's population increased?** Virtually all the world's natural increase is concentrated in the relatively poor countries of Africa, Asia, and Latin America. In contrast, most European and North American countries now have low population growth rates, and some are experiencing population declines. The difference in natural increase between MDCs and LDCs is attributable to differences in CBRs rather than in CDRs.
3. **Why is population increasing at different rates in different countries?** The demographic transition is a change in a country's population. A country moves from a condition of high birth and death rates, with little population growth, to a condition of low birth and death rates, with low population growth. During this process the total population increases enormously, because the death rate declines some years before the birth rate does. The MDCs of Europe and North America have reached or

neared the end of the demographic transition. African, Asian, and Latin American countries are at the stages of the demographic transition characterized by rapid population growth, in which death rates have declined sharply, but birth rates remain relatively high.

4. **Why might the world face an overpopulation problem?** The rate at which global population grew during the second half of the twentieth century was unprecedented in history. A dramatic decline in the death rate produced the increase. With death rates controlled, for the first time in history the most critical factor determining the size of the world's population is the birth rate. Birth rates began to decline sharply during the 1990s, slowing world population growth and reducing fear of overpopulation in most regions. Scientists agree that the current rate of natural increase must be further reduced, but they disagree on the appropriate methods for achieving this goal.

## CASE STUDY REVISITED

### India Versus China

The world's two most populous countries, China and India, will heavily influence future prospects for global overpopulation. These two countries—together encompassing more than one-third of the world's population—have adopted different family-planning programs. As a result of less effective policies, India adds 11 million more people each year than does China. Current projections show that India would surpass China as the world's most populous country during the 2030–40 decade.

#### India's Population Policies

India, like most countries in Africa, Asia, and Latin America, remained in stage 1 of the demographic transition until the late 1940s. During the first half of the twentieth century, population increased modestly—less than 1 percent per year—and even decreased in some years because of malaria, famines, plagues, and cholera epidemics. For example, more than 16 million Indians—approximately 5 percent of the population—died of influenza in 1918 and 1919, leaving a population at the 1921 census lower than that of 10 years earlier.

Immediately following independence from England in 1947, India's death rate declined sharply (to 20 per 1,000 in 1951), whereas the CBR remained relatively high (about 40). Consequently, the NIR jumped to 2 percent per year.

In response to this rapid growth, India became the first country to embark on a national family-planning program in 1952. The government has established clinics and has provided information about alternative methods of birth control. Birth-control devices have been distributed free or at subsidized prices. Abortions, legalized in 1972, have been performed at a rate of several million per year. All together, the government spends several hundred million dollars annually on various family-planning programs.

India's most controversial family-planning program was the establishment of camps in 1971 to perform sterilizations, surgical procedures by which people were made incapable of reproduction.

A sterilized person was entitled to a payment, which has been adjusted several times but generally has been equivalent to the average monthly income in India. At the height of the program, in 1976, 8.3 million sterilizations were performed during a 6-month period, mostly on women.

The birth-control drive declined in India after 1976. Widespread opposition to the sterilization program grew in the country, because people feared that they would be forcibly sterilized. The prime minister, Indira Gandhi, was defeated in 1977, and the new government emphasized the voluntary nature of birth-control programs. The term *family planning*, which the Indian people associated with the forced sterilization policy, was replaced by the term *family welfare* to indicate that compulsory birth-control programs had been terminated. Although Mrs. Gandhi served again as prime minister from 1980 until she was assassinated in 1984, she did not emphasize family planning because of the opposition during her previous administration.

Government-sponsored family-planning programs have instead emphasized education, including advertisements on national radio and television networks and information distributed through local health centers. Given the cultural diversity of the Indian people, the national campaign has had only limited success. The dominant form of birth control continues to be sterilization of women, many of whom have already borne several children, rather than vasectomies of men.

Some local governments in India have decided that their local officials should have no more than two children. In some places, pay raises, access to land or housing, and other incentives have been given to government officials with no more than two children. Elsewhere, people are prohibited from running for office if they have more than two children.

As a result of India's largely voluntarily family-planning policies, the CBR has drifted down to the mid-20s per 1,000. But with medical advances, the CDR has also moved down to under 10. Consequently, the NIR has been lowered, but only slightly, from around 2.0 to 1.7.

(Continued)